

REMARKS

This Amendment responds to the Office Action dated March 15, 2004 in which the Examiner rejected claims 1-8 under 35 U.S.C. § 112, second paragraph, rejected claims 1, 5 and 9-11 under 35 U.S.C. § 102(b) and rejected claims 2 and 6 under 35 U.S.C. § 103.

As indicated above, claims 1 and 5 have been amended to recite all essential elements. Therefore Applicants respectfully request the Examiner withdraws the rejection to claims 1 and 8 under 35 U.S.C. § 112, second paragraph.

Claim 1 claims a method of shaping an end face of an optical fiber, claim 5 claims an arrangement for shaping an end face of an optical fiber and claim 9 claims a computer program for use in an end face shaping arrangement for optical fibers. The method, arrangement and computer program include repetitively calculating an actual radius value of an end face of the optical fiber, comparing the actual radius value with a predetermined radius value, continually heating of the end face if the actual radius value is lower than the predetermined radius value and discontinuing the heating of the end face if the actual radius value is equal to or higher than the predetermined radius value.

Through the method, arrangement and computer program repetitively calculating an actual radius value of an end face and comparing the actual radius value with the predetermined radius value, as claimed in claims 1, 5 and 9, the claimed invention provides a method, arrangement and computer program which automatically shapes the end face of an optical fiber while making it possible to achieve a hemispherical shape with very small margin of error independent of who the machine operator is. Furthermore, the continuous process with melting, cone

shaping and forming of the end face with carefully controlled heating reduces the risk of involvement of unwanted particles in the glass. The prior art does not show, teach or suggest the method, arrangement and computer program as claimed in claims 1, 5 and 9.

Applicants respectfully submit that the amendments to claims 1 and 5 do not narrow the literal scope of the claim.

Claims 1, 5 and 9-11 were rejected under 35 U.S.C. § 102(b) as being anticipated by *Arima et al.* (Japanese Reference 2-205808).

Applicants respectfully traverse the Examiner's rejection of the claims under 35 U.S.C. § 102(b). The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, Applicants respectfully request the Examiner withdraws the rejection to the claims and allows the claims to issue.

Arima et al. appears to disclose optimizing the curvature of the spherical surface of the tip of an optical fiber by processing an image, obtained by photographing, enlarging, and displaying the tip shape of the optical fiber which is becoming spherical by a television camera, by a central processor and comparing its curvature with the best curvature. When the tip surface of the fiber is machined into a spherical surface with desired curvature, the image of the fused fiber tip 1A is displayed on a television monitor 21 by using the television camera 20 and processed by the central processor 25. Then when the fiber tip 1A is machined to the best curvature, the supply of gaseous hydrogen and gaseous oxygen to an oxygen and hydrogen burner 10 is stopped under the command of the central processor 25. The surface of the fiber tip 1A which is thus made spherical is compared with the best curvature, and consequently the obtained spherical surface

of the fiber tip nearly has the best curvature, the shape of the fiber tip surface becomes stable, and its variance is reduced.

Thus, *Arima et al.* merely discloses obtaining an image of a fused fiber tip and comparing it with a best curvature. Thus nothing in *Arima et al.* shows, teaches or suggests repetitively calculating an actual radius value of the end face and then comparing the actual radius value with a predetermined radius value as claimed in claim 1. Rather, *Arima et al.* merely discloses obtaining an image and processing the image to compare with a best curvature. In other words, nothing in *Arima et al.* shows, teach or suggests the precise steps used as claimed in claims 1, 5 and 9.

Since *Arima et al.* merely discloses comparison of images and does not show, teach or suggest repetitively calculating an actual radius value of an end face and comparing the actual radius value with a predetermined radius value as claimed in claims 1, 5 and 9, Applicants respectfully request the Examiner withdraws the rejection to claims 1, 5 and 9 under 35 U.S.C. § 102(b).

Claims 10-11 depend from claim 9 and recite additional features. Applicants respectfully submit that claims 10-11 would not have been anticipated by *Arima et al.* at least for the reasons as set forth above. Therefore, Applicants respectfully request the Examiner withdraws the rejection to claims 10-11 under 35 U.S.C. § 102(b).

Claims 2 and 6 were rejected under 35 U.S.C. § 103 as being unpatentable over *Arima et al.* and further in view of *Takimoto et al.* (U.S. Patent No. 5,318,610).

Applicants respectfully traverse the Examiner's rejection of the claims under 35 U.S.C. § 103. The claims have been reviewed in light of the Office Action, and for

reasons which will be set forth below, Applicants respectfully request the Examiner withdraws the rejection to the claims and allows the claims to issue.

As discussed above, *Arima et al.* merely discloses a general comparison of images and does not show, teach or suggest repetitively calculating an actual radius value of an end face and comparing the actual radius value with the predetermined radius value as claimed in claims 1 and 5.

Takimoto et al. appears to disclose an apparatus which utilizes a fusion-elongation method to manufacture fiber couplers which couple a plurality of optional fibers. (col. 1, lines 11-13) A fiber coupler manufacturing apparatus comprising a pair of fiber holding portions and a fiber clamp disposed on each of the fiber holding portions for holding at least two optical fibers. A weight and pulley system is arranged wherein a first weight is coupled to each of the fiber holding portions to pull the fiber holding portions away from each other to apply tension to the optical fibers. A heating unit is disposed between the fiber holding portions and proximate to the optical fibers to heat the optical fibers. A second weight is coupled to either the fiber holding portions or the first weight and rests on a movable platform. As the movable platform descends in a vertical direction, the second weight applies additional force to the fiber holding portions and thus applies additional tension to the optical fibers. (abstract) In the fiber coupler manufacturing apparatus, a breaking test can be easily and automatically performed along with the series of steps, that is, the fusing, elongation, and molding steps, so that the production and reliability of the fiber couplers can be improved. The breaking test is performed on the formed coupler portion by applying a predetermined tension to the optical fibers 1 (step 105). (col. 3, lines 38-45)

Thus, *Takimoto et al.* merely discloses a fiber coupler manufacturing apparatus which also tests the coupling using tension. Nothing in *Takimoto et al.* shows, teaches or suggests a method of shaping an end face of an optical fiber as claimed in claims 1 and 5. Rather, *Takimoto et al.* merely discloses a fiber coupling manufacturing apparatus for fusing a bundle of fibers together and a breaking test therefor.

The combination of *Takimoto et al.* and *Arima et al.* would not be possible since the two references are directed to different inventions. Even assuming arguendo that the references could be combined, the combination would merely suggest that after forming the tip of the optical fiber in *Arima et al.* to couple a plurality of fibers together as taught by *Takimoto et al.* Thus, since nothing in the combination of *Arima et al.* and *Takimoto et al.* show, teach or suggest the invention as claimed in claim 1, Applicants respectfully submit that the combination of the references would not show, teach or suggest the invention as claimed in claims 2 and 6. Therefore, Applicants respectfully request the Examiner withdraws the rejection to claims 2 and 6 under 35 U.S.C. § 103.

The prior art of record, which is not relied upon, is acknowledged. The references taken singularly or in combination do not anticipate or make obvious the claimed invention.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is requested to contact, by telephone, the applicant's

undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, applicant respectfully petitions for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

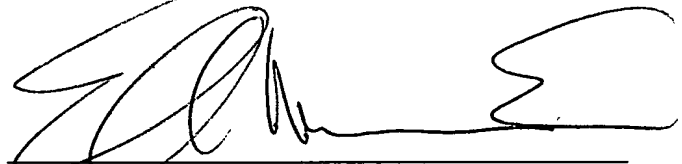
In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date: June 15, 2004

By:

A handwritten signature in black ink, appearing to read 'Ellen Marcie Emas', written over a horizontal line.

Ellen Marcie Emas
Registration No. 32,131

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620